CLAIMS:

1. A positioning device (18) to position at least a first display (9, 12, 14) of a hardware unit (17), which can be lit by a first color beam (B-FS, G-FS, R-FS, P-FS), in relation to at least one other optically active element (9, 11, 12, 14, 16) of the hardware unit (17), in order to project the image generated by at least one display (9, 12, 14) by projecting a projection beam (PS) that can be emitted by the hardware unit (17) in a plane of projection (P), having holding means (H) for holding at least the first display (9, 12, 14) during a positioning operation and a subsequent operation to fix the positioned display (9, 12, 14), and having optical means (16, T) to which the projection beam (PS) can be fed and which are designed to emit test image information (P-BI) suitable for assessing the positioning of the display (9, 12, 14), and having control means (19) for controlling the holding means (H) in order to adjust the position of the first display (9, 12, 14) in relation to the other optically active elements (9, 11, 12, 14, 16) during the positioning operation, and having fixing means for permanently fixing the positioned first display (9, 12, 14) during the fixing operation, characterized in that the optical means (16, T) contain at least a first telescopic optical system (T), which is designed to focus on individual pixels (PX) in the first display (9, 12, 14).

2. A positioning device (18) as claimed in Claim 1, characterized in that as optically active elements the hardware unit (17) contains at least a second display (9, 12, 14) that can be lit by a second color beam (B-FS, G-FS, R-FS, P-FS), hardware optics (16) and a recombination prism (11) designed to recombine the first color beam (B-FS, G-FS, R-FS, P-FS) and the second color beam (B-FS, G-FS, R-FS, P-FS) and to emit the projection beam (PS), and in that in the positioning operation the positioning device (18) is designed to position at least the first display (9, 12, 14) and the second display (9, 12, 14) in relation to one another and in relation to the other optically active elements (11, 16), in order to project the images generated by the two displays (9, 12, 14) congruently in the plane of projection (P).

3. A positioning device (18) as claimed in Claim 2, characterized in that the optical means (16, T) also contain a second, a third and a fourth telescopic optical system (T),

one telescopic optical system (T) in each case being capable of focusing on pixels (PX) arranged in one of the four corners of the first display (9, 12, 14) and possibly of the second display (9, 12, 14).

4. A positioning device (18) as claimed in Claim 2, characterized in that means of illumination (LD-1, LD-2, LD-3) are provided for generating the first and the second color beams (P-FS) and in that the means of illumination take the form of at least one light emitting diode (LD-1, LD-2, LD-3).

5. A positioning device (18) as claimed in Claim 1, characterized in that the holding means (H) for the first display (9, 12, 14) have a loading device, in which during a loading operation the first display (9, 12, 14) can be pressed against reference positions by means of positioning pins, in order to position the first display (9, 12, 14) in a starting position for the subsequent positioning operation.

6. A positioning device (18) as claimed in Claim 1, characterized in that the holding means (H) have a positioning table, which is designed for adjusting the position of the first display (9, 12, 14) along and about the three spatial axes, the positioning device (18) being designed, when the first display (9, 12, 14) is rotated about one spatial axis, to compensate for a displacement of the displays (9, 12, 14) along the other two spatial axes.

7. A positioning device (18) as claimed in Claim 1, characterized in that feedback control means are provided, to which the test image information (P-BI) suitable for assessing the positioning of the displays (9, 12, 14) can be fed from the optical means (16, T) and which are designed to automatically detect control information (SI) for controlling the holding means (H).

8. A positioning device (18) as claimed in Claim 1, characterized in that the optical means (16, T) contain the hardware optics (16) of the hardware unit (17), the hardware optics (16) also being contained in a finished projector containing the hardware unit (17).

9. A positioning method for the positioning of at least a first display (9, 12, 14) of a hardware unit (17), which can be lit by first color beam (B-FS, G-FS, R-FS, P-FS), in

relation to at least one other optically active element (9, 11, 12, 14, 16) of the hardware unit (17), in order to project the image generated by at least one display (9, 12, 14) by projecting a projection beam (PS) that can be emitted by the hardware unit (17) in a plane of projection (P), said method involving the following stages:

holding at least the first display (9, 12, 14) during a positioning operation and a subsequent operation to fix the positioned display (9, 12, 14);

delivery of the projection beam (PS) to at least one telescopic optical system (T), which is designed to focus on individual pixels (PX) in the first display (9, 12, 14) and which emits test image information (P-BI) suitable for assessing the positioning of the display (9, 12, 14);

controlling the holding means (H), in order to adjust the position of the first display (9, 12, 14) in relation to the other optically active elements (9, 11, 12, 14, 16) during the positioning operation;

permanent fixing of the positioned first display (9, 12, 14) during the fixing operation.

10. A positioning method as claimed in Claim 9, characterized in that during a loading operation the first display (9, 12, 14) is pressed against reference positions by means of positioning pins, in order to position the first display (9, 12, 14) in a starting position for the subsequent positioning operation.

11. A positioning method as claimed in Claim 9, characterized in that in the positioning, the position of the first display (9, 12, 14) is adjustable along and about the three spatial axes, where a displacement of the display (9, 12, 14) along the other two spatial axes that occurs when rotating the first display (9, 12, 14) about one spatial axis is automatically compensated for.